

**WHAT IS CLAIMED IS:**

1. A semiconductor device comprising:  
an insulating film comprising silicon oxide on an insulating surface,  
wherein the insulating film includes halogen at a concentration of  $5 \times 10^{20} \text{ cm}^{-3}$   
or less and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less which are detected by second ion  
mass spectroscopy.
2. A device according to claim 1, wherein the halogen is chlorine.
3. A device according to claim 1, wherein the halogen is fluorine.
4. A device according to claim 1,  
wherein the insulating film includes carbon at a concentration of  $1 \times 10^{18} \text{ cm}^{-3}$   
or less which is detected by the second ion mass spectroscopy.
5. A device according to claim 1,  
wherein the insulating film includes halogen at a concentration of  $1 \times 10^{17} \text{ cm}^{-3}$   
or more which is detected by the second ion mass spectroscopy.
6. A device according to claim 1,  
wherein the insulating film is a gate insulating film.
7. A device according to claim 1,  
wherein the insulating film is an insulating film in a thin film transistor.
8. A device according to claim 1,  
wherein the insulating film covers an even surface over a glass substrate.

9. A device according to claim 1,  
wherein the insulating film is formed by plasma chemical vapor deposition using an organic silane.
10. A device according to claim 9,  
wherein the organic silane comprises at least a material selected from the group consisting of  $\text{Si}(\text{OC}_2\text{H}_5)_4$ ,  $\text{Si}_2\text{O}(\text{OC}_2\text{H}_5)_6$ ,  $\text{Si}_3\text{O}_2(\text{OC}_2\text{H}_5)_8$ ,  $\text{Si}_4\text{O}_3(\text{OC}_2\text{H}_5)_{10}$  and  $\text{Si}_5\text{O}_4(\text{OC}_2\text{H}_5)_{12}$ .
11. A semiconductor device comprising:  
a crystalline semiconductor island on an insulating surface; and  
an insulating film including silicon oxide to cover the crystalline semiconductor island,  
wherein the insulating film includes halogen at a concentration of  $5 \times 10^{20} \text{ cm}^{-3}$  or less and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.
12. A device according to claim 11,  
wherein the concentrations of halogen and carbon are detected by secondary ion mass spectroscopy.
13. A device according to claim 11, wherein the halogen is chlorine.
14. A device according to claim 11, wherein the halogen is fluorine.
15. A device according to claim 11,  
wherein the insulating film includes carbon at a concentration of  $1 \times 10^{18} \text{ cm}^{-3}$  or less.

16. A device according to claim 11,  
wherein the insulating film includes halogen at a concentration of  $1 \times 10^{17} \text{ cm}^{-3}$   
or more.
17. A device according to claim 11,  
wherein the insulating film is formed by plasma chemical vapor deposition  
using an organic silane.
18. A device according to claim 17,  
wherein the organic silane comprises at least a material selected from the group  
consisting of  $\text{Si}(\text{OC}_2\text{H}_5)_4$ ,  $\text{Si}_2\text{O}(\text{OC}_2\text{H}_5)_6$ ,  $\text{Si}_3\text{O}_2(\text{OC}_2\text{H}_5)_8$ ,  $\text{Si}_4\text{O}_3(\text{OC}_2\text{H}_5)_{10}$  and  
 $\text{Si}_5\text{O}_4(\text{OC}_2\text{H}_5)_{12}$ .
19. A semiconductor device including at least a thin film transistor comprising:  
a crystalline semiconductor island on an insulating surface;  
a silicon oxide film over the crystalline semiconductor island; and  
a conductive film including at least one of aluminum, titanium, and titanium  
nitride, said conductive film being formed on the silicon oxide film,  
wherein the silicon oxide film includes halogen at a concentration of  $5 \times 10^{20}$   
 $\text{cm}^{-3}$  or less and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.
20. A device according to claim 19,  
wherein the concentrations of halogen and carbon are detected by secondary  
ion mass spectroscopy.
21. A device according to claim 19, wherein the halogen is chlorine.
22. A device according to claim 19, wherein the halogen is fluorine.

23. A device according to claim 19,  
 wherein the silicon oxide film includes carbon at a concentration of  $1 \times 10^{18} \text{ cm}^{-3}$  or less.

24. A device according to claim 19,  
 wherein the silicon oxide film includes halogen at a concentration of  $1 \times 10^{17} \text{ cm}^{-3}$  or more.

25. A device according to claim 19,  
 wherein the silicon oxide film is formed by plasma chemical vapor deposition using an organic silane.

Sub A: 26. A device according to claim 17,  
 wherein the organic silane comprises at least a material selected from the group consisting of  $\text{Si}(\text{OC}_2\text{H}_5)_4$ ,  $\text{Si}_2\text{O}(\text{OC}_2\text{H}_5)_6$ ,  $\text{Si}_3\text{O}_2(\text{OC}_2\text{H}_5)_8$ ,  $\text{Si}_4\text{O}_3(\text{OC}_2\text{H}_5)_{10}$  and  $\text{Si}_5\text{O}_4(\text{OC}_2\text{H}_5)_{12}$ .

27. A semiconductor device including at least a thin film transistor comprising:  
 a crystalline semiconductor island on an insulating surface;  
 a gate insulating film including silicon oxide on the crystalline semiconductor island; and  
 a gate electrode on the gate insulating film,  
 wherein the gate insulating film includes halogen at a concentration of  $5 \times 10^{20} \text{ cm}^{-3}$  or less and carbon at a concentration of  $5 \times 10^{19} \text{ cm}^{-3}$  or less.

28. A device according to claim 27,  
 wherein the concentrations of halogen and carbon are detected by secondary ion mass spectroscopy.

29. A device according to claim 27, wherein the halogen is chlorine.

